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Identification of microbes in inoculant for agarwood (Gaharu) formation using molecular biological techniques (Article)

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Abstract

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The distinctive fragrance and pleasing odor of the agarwood came from the resinous materials impregnated in the phloem of the tree as a response to infection. Artificial inoculants have been developed by "trial and error" methods to boost the resin formation. These artificial inoculants have been used widely in this region despite no strong scientific data and that they contribute to most of the cost for agarwood resin production. In collaboration with an agarwood industry player, a research work was initiated to isolate and identify the microorganisms present in an inoculant that has been proven effective in boosting the agarwood resin formation. Fifteen clones were constructed by extracting and amplifying the 16S rDNA and ITS sequences from the pure cultures isolated from the inoculant. Three genera of microorganisms (Bacillus, Paenabacillus, Monascus) have been successfully identified. Two bacteria clones were phylogenetically affiliated with Paenibacillus sp. and four clones were associated with Bacillus sp. as well as three fungi clones were associated with Monascus sp. All the identified species are spore-forming microorganisms. The genera of Bacillus and Paenabacillus were able to utilize carbohydrate and protein from the tree as their energy sources. These two genera may be crucial to boost resin formation in agarwood.

Author keywords

16S rDNA Agarwood Inoculant ITS Phylogeny

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